

CLAIMS

What is claimed is:

1. In a centripetally-motivated microsystems platform, a microfluidics structure comprising:

one or a plurality of microchannels that join one or a plurality of capillary junctions, wherein each microchannel passes through a change in a lateral dimension where the microchannel joins a capillary junction; and

one or a plurality of mixing microchannels, each mixing microchannel being fluidly connected to the capillary junction of a microchannel, wherein each mixing microchannel is configured to bend a plurality of times around a plurality of curves as the mixing microchannel traverses a longitudinal path on the platform.

2. The microfluidics structure of claim 1, wherein each mixing microchannel fluidly connects to a second capillary junction, wherein the second capillary junction is separated by the longitudinal extent of the mixing microchannel from the capillary junction between the mixing microchannel and one of the plurality of microchannels.

3. The microfluidics structure of claim 1, wherein each mixing microchannel fluidly connects to a detection chamber.

4. The microfluidics structure of claim 1, further comprising one or a plurality of reagent reservoirs containing a reagent solution fluidly connected to the one or a plurality of microchannels.

5. The microfluidics structure of claim 1, further comprising one or a plurality of sample reservoirs containing a sample solution fluidly connected to the one or a plurality of microchannels.

6. The microfluidics structure of claim 1, wherein the change in the lateral dimension includes an interior diameter of the microchannel changing by between about 0% and about 95%.

7. The microfluidics structure of claim 1, wherein a length of the one or a plurality of mixing microchannels is chosen to provide a sufficient time for mixing via diffusion under an influence of centripetal acceleration.

8. The microfluidics structure of claim 1, wherein each mixing microchannel has a length of from about 1 mm to about 100mm.

9. The microfluidics structure of claim 1, wherein each mixing microchannel comprises a plurality of bends having angles greater than 90°.